



# **Rocky Flats Environmental Technology Site**

## **RECONNAISSANCE LEVEL CHARACTERIZATION REPORT (RLCR)/PRE-DEMOLITION SURVEY REPORT (PDSR)**

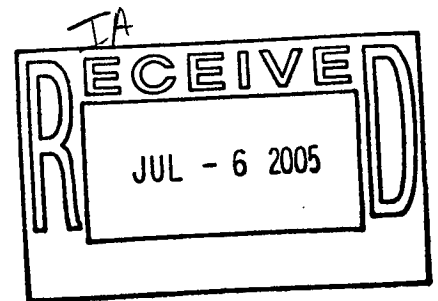
### **Building 440 Eastside Closure Project**

**REVISION 0**

**May 12, 2005**

Change Control:

- Rev 1. Revised Section 4.3, added discussion about lead based paint - 5/17/05.
- Rev 1. Revised Section 4.4, added discussion about lead based paint - 5/17/05.
- Rev 1. Revised Section 7, adjusted waste volumes for Eastside only - 5/18/05.



**CLASSIFICATION REVIEW NOT REQUIRED PER  
ADMIN RECORD**

IA-A-002640


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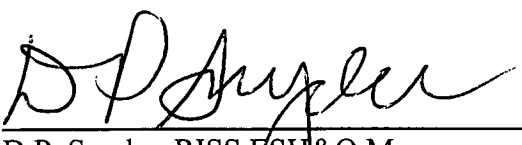
**RECONNAISSANCE LEVEL CHARACTERIZATION  
REPORT (RLCR)/PRE-DEMOLITION SURVEY REPORT  
(PDSR)**

**Building 440 Eastside Closure Project**

**REVISION 0**

**May 12, 2005**

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- A Facility Location Map
- B Historical Site Assessment Report
- C Radiological Data Summaries and Survey Maps
- D Chemical Data Summaries and Sample Maps
- E Data Quality Assessment (DQA) Detail

## ABBREVIATIONS/ACRONYMS

ACM	Asbestos Containing Material
Be	Beryllium
CDPHE	Colorado Department of Public Health and the Environment
DCGL <sub>EMC</sub>	Derived Concentration Guideline Level – elevated measurement comparison
DCGL <sub>w</sub>	Derived Concentration Guideline Level – Wilcoxon Rank Sum Test
D&D	Decontamination and Decommissioning
DDCP	Decontamination and Decommissioning Characterization Protocol
DOE	U.S. Department of Energy
DPP	Decommissioning Program Plan
DQA	Data quality assessment
DQOs	Data quality objectives
EPA	U.S. Environmental Protection Agency
FDPM	Facility Disposition Program Manual
HVAC	Heating, ventilation, air conditioning
HSAR	Historical Site Assessment Report
HEUN	Highly Enriched Uranyl Nitrate
IHSS	Individual Hazardous Substance Site
IWCP	Integrated Work Control Package
K-H	Kaiser-Hill
LBP	Lead-based paint
LLW	Low-level waste
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MDA	Minimum detectable activity
MDC	Minimum detectable concentration
NORM	Naturally occurring radioactive material
NRA	Non-Rad-Added Verification
OSHA	Occupational Safety and Health Administration
PARCC	Precision, accuracy, representativeness, comparability and completeness
PCBs	Polychlorinated Biphenyls
PDS	Pre-demolition survey
QC	Quality Control
RCRA	Resource Conservation and Recovery Act
RFCA	Rocky Flats Cleanup Agreement
RFETS	Rocky Flats Environmental Technology Site
RFEO	Rocky Flats Field Office
RLC	Reconnaissance Level Characterization
RLCR	Reconnaissance Level Characterization Report
RSA	Removable Surface Activity
RSP	Radiological Safety Practices
SVOCs	Semi-volatile organic compounds
TCLP	Toxicity Characteristic Leaching Procedure
TSA	Total surface activity
VOCs	Volatile organic compounds

## EXECUTIVE SUMMARY

A combination Reconnaissance Level Characterization (RLC) and Pre-Demolition Survey (PDS) was performed to enable compliant disposition and waste management of Building 440 Eastside. The Building 440 Westside RLC/PDS will be performed after the repack glove box and ventilation system are removed, and will be documented in a standalone PDS report. Because this Type 2 facility will be demolished, the characterization was performed in accordance with the Pre-Demolition Survey Plan (MAN-127-PDSP). Facility surfaces characterized as part of this RLC/PDS included the walls, ceiling, and roof of the Building 440 Eastside (i.e., rooms 140A, 140B, and 141). Environmental media beneath and surrounding the facility was not within the scope of this RLC/PDS and will be addressed in accordance with the Soil Disturbance Permit process and in compliance with RFCA.

The RLC/PDS encompassed both radiological and chemical characterization to enable compliant disposition and waste management pursuant to the D&D Characterization Protocol (MAN-077-DDCP). The characterization built upon physical, chemical and radiological hazards identified in the facility-specific Historical Site Assessment Report for the Area 5 - Group 9 Facilities, dated April 2003, Revision 1.

Results indicate that no radiological, beryllium, asbestos or PCB contamination exists in excess of the PDSP unrestricted release limits in the Building 440 Eastside. Based on the analysis of radiological, chemical and physical hazards, Building 440 Eastside is classified as a RFCA Type 2 facility pursuant to the RFETS Decommissioning Program Plan (DPP; K-H, 1999) due to radiologically contaminated equipment (i.e., the C-Cell, Repack glovebox, and glovebox ventilation system) located in the Westside of the facility. Building 440 Eastside can be demolished and the waste managed as sanitary waste. To ensure that the facility remains free of contamination and that PDS data remain valid, Level 2 isolation controls have been established and the areas posted accordingly.

## 1 INTRODUCTION

A combination Reconnaissance Level Characterization (RLC) and Pre-Demolition Survey (PDS) was performed to enable compliant disposition and waste management of the Building 440 Eastside. The Building 440 Westside RLC/PDS will be performed in the near future after the repack glove box and ventilation system are removed, and will be documented in a standalone RLC/PDS report. Because this Type 2 facility will be demolished, the characterization was performed in accordance with the Pre-Demolition Survey Plan (MAN-127-PDSP). Building surfaces characterized as a part of this RLC/PDS included the walls, ceiling and roof of Building 440 Eastside (i.e., rooms 140A, 140B, and 141). Environmental media beneath and surrounding the facility were not within the scope of this RLC/PDS and will be addressed in accordance with the Soil Disturbance Permit process and in compliance with RFCA.

Building 440 Eastside was an "anticipated" Type 2 RFCA facility prior to the performance of this RLC/PDS effort. A Type 2 RLC had not yet been performed in this building because the building had been in operation until recently, thus the majority of the building surfaces were inaccessible for characterization. Since the performance of this RLC/PDS effort was performed in accordance with the Pre-Demolition Survey Plan (MAN-127-PDSP), no further characterization of this facility is necessary.

As part of the Rocky Flats Environmental Technology Site (RFETS) Closure Project, numerous facilities will be removed, among these is Building 440. The location of this facility is shown in Attachment A, *Facility Location Map*. The east portion of the building is highlighted in yellow in Attachment A (i.e., rooms 140A, 140B, and 141). This facility no longer supports the RFETS mission and will be removed to reduce Site infrastructure, risks and/or operating costs.

Before this Type 2 facility can be demolished, the Data Quality Objectives (DQOs) for a Pre-Demolition Survey (PDS) must be satisfied; this document presents the RLC/PDS results for the Building 440 Eastside. The RLC/PDS was conducted pursuant to the Decontamination and Decommissioning Characterization Protocol (MAN-077-DDCP) and the Pre-Demolition Survey Plan for D&D Facilities (MAN-127-PDSP). The RLC/PDS is built upon physical, chemical and radiological hazards identified in the facility-specific Historical Site Assessment Report for the Area 5 - Group 9 Facilities, dated April 2003, Revision 1.

### 1.1 Purpose

The purpose of this report is to communicate and document the results of the Building 440 Eastside RLC/PDS effort. A PDS is performed prior to building demolition to define the final radiological and chemical conditions of a facility. Final conditions are compared with the release limits for radiological and non-radiological contaminants. PDS results will enable project personnel to make final disposition decisions, develop related worker health and safety controls, and estimate waste volumes by waste types.

## 1.2 Scope

This report presents the final radiological and chemical conditions of the Building 440 Eastside facility. Environmental media beneath and surrounding the facility are not within the scope of this RLCR/PDSR and will be addressed in accordance with the Soil Disturbance Permit process and in compliance with RFCA.

## 1.3 Data Quality Objectives

The Data Quality Objectives (DQOs) used in designing this RLC/PDS were the same DQOs identified in the Pre-Demolition Survey Plan for D&D Facilities (MAN-127-PDSP). Refer to section 2.0 of MAN-127-PDSP for these DQOs.

## 2 HISTORICAL SITE ASSESSMENT

A facility-specific Historical Site Assessment Report (HSAR) for the Area 5 - Group 9 Facilities, dated April 2003, Revision 1, was conducted to understand the facility history and related hazards. The assessment consisted of facility walk-downs, interviews, and document review, including review of the Historical Release Report (refer to the D&D Characterization Protocol, MAN-077-DDCP). Results were used to identify data gaps and needs, and to develop radiological and chemical characterization packages. Refer to Attachment B, *Historical Site Assessment Report*, for a copy of the Building 440 HSAR. In summary, the HSAR identified a low potential for radiological, chemical, beryllium or asbestos hazards for the Eastside.

## 3 RADIOLOGICAL CHARACTERIZATION AND HAZARDS

Building 440 Eastside was characterized for radiological hazards per the RLCP/PDSP. Radiological characterization was performed to define the nature and extent of radioactive materials that may be present on the facility surfaces. Measurements were performed to evaluate the contaminants of concern. Based upon a review of historical and process knowledge, facility walk-downs, and MARSSIM guidance, a Radiological Characterization Plan was developed during the planning phase that describes the minimum survey requirements (refer to the RISS Characterization Project files for the Building 440 Radiological Characterization Plan). One Class 2 radiological survey unit package was developed for the Building 440 Eastside: 440501. A Class 2 designation was chosen since this area was not expected to contain any residual radioactivity greater than the DCGL<sub>w</sub> even though the Historical Site Assessment and process knowledge of this survey unit showed that this building stored and shipped TRU and LLW materials during past operations. Individual radiological survey unit packages are maintained in the RISS Characterization Project files.

Building 440 Eastside survey unit package was developed in accordance with Radiological Safety Practices (RSP) 16.01, *Radiological Survey/Sampling Package Design, Preparation, Control, Implementation and Closure*. Total surface activity (TSA), removable surface activity (RSA), and scan measurements were collected in accordance with RSP 16.02 *Radiological Surveys of Surfaces and Facilities*. Media samples were collected in accordance with RSP 16.03 *Radiological Samples of Building Media*. Radiological survey data were verified, validated and evaluated in accordance with RSP 16.04, *Radiological Survey/Sample Data Analysis*. Quality control measures were implemented relative to the survey process in accordance with RSP 16.05, *Radiological Survey/Sample Quality Control*.

A total of 53 total surface activity (TSA) measurements (32 random, 19 biased and 2 QC), 51 removable surface activity (RSA) measurements (32 random and 19 biased) and 5 surface media (paint) samples and five (5) Pre and Post TSA and RSA measurements were collected from painted floor surfaces. Wall and ceiling surfaces were factory original paint and thus were not media (paint) sampled, therefore the five (5) floor samples were adequate to properly characterize this survey unit. A minimum alpha scan survey of 50% of all floor surfaces (852 m<sup>2</sup> minimum) at biased locations and 5% of wall and ceiling surfaces (219 m<sup>2</sup> minimum) was performed. None of the measurements or scans indicated elevated activity above applicable DCGL values.

Radiological survey data, statistical analysis results, survey locations and radiological scan maps are presented in Attachment C, *Radiological Data Summary and Survey Maps*. Isolation control postings are displayed on the building entrances to ensure no radioactive materials are introduced.

Exterior radiological surveys for Building 440 were performed as part of the West Side Exterior PDS Report, which was approved on March 24, 2005 by DOE and CDPHE. The West Side Exterior PDS Report confirmed that the exterior surfaces of Building 440 do not contain radiological contamination above the surface contamination guidelines provided in the PDSP. The West Side Exterior PDS Report and survey data, statistical analysis results, and survey map locations are maintained in the RISS Characterization Project files.



## **4 CHEMICAL CHARACTERIZATION AND HAZARDS**

Building 440 Eastside was characterized for chemical hazards per the RLCP/PDSP. Chemical characterization was performed to determine the nature and extent of chemical contamination that may be present on, or in the facility. Based upon a review of historical and process knowledge, visual inspections, and PDSP DQOs, additional sampling needs were determined. A Chemical Characterization Plan was developed during the planning phase that describes sampling requirements and the justification for the sample locations and estimated sample numbers. The contaminants of concern were asbestos, beryllium, RCRA/CERCLA, lead and PCBs. Refer to Attachment D, *Chemical Summary Data and Sample Maps*, for details on sample results and sample locations. Isolation control postings are displayed on affected facility to ensure no hazardous materials are introduced.

### **4.1 Asbestos**

A survey of building materials suspected of containing asbestos was conducted in Building 440. A CDPHE-certified asbestos inspector conducted the inspection and no asbestos containing building materials was identified in the Eastside of Building 440 that required sampling. Building 440 Eastside was recently constructed in the 2002 and mainly consists of metal and concrete materials. On this basis, asbestos sampling was not conducted as part of this RLC/PDS in the Building 440 Eastside.

### **4.2 Beryllium**

Based on the HSAR, Interview Checklists, and the Known Beryllium Area list, there was not adequate historical or process knowledge to conclude that beryllium was not present in Building 440. Consequently, random and biased beryllium sampling was conducted in accordance with PRO-536-BCPR, Beryllium Characterization Procedure. Random and biased beryllium sample locations corresponded with the most probable areas of dust accumulation (including beryllium dust), assuming airborne deposition. Random beryllium sample locations were computer generated.

All RLC/PDS beryllium laboratory results from Building 440 Eastside were less than the investigative limit of  $0.1 \mu\text{g}/100\text{cm}^2$ . RLC/PDS beryllium laboratory sample data and location maps are contained in Attachment D, *Chemical Data Summaries and Sample Maps*.

### **4.3 RCRA/CERCLA Constituents [including Metals, Volatile Organic Compounds (VOCs) and Semi Volatile Organic Compounds (SVOCs)]**

The Closure Description Document (CDD) for RCRA unit 440.1 in Building 440 (05-RF-00149) was submitted to CDPHE on March 3, 2005 and approved by CDPHE on March 29, 2005. Room 141 is in the Eastside of Building 440 and will undergo RCRA closure as defined in the CDD prior to building demolition. Therefore, no additional RCRA/CERCLA sampling and analysis was conducted or required as part of this RLC/PDS.

Rev. / Sampling for lead in paint in Building 440 Eastside was not performed. Environmental Waste Compliance Guidance #27, *Lead-based Paint (LBP) and Lead-based paint Debris Disposal*, states that LBP debris generated outside of currently identified high contamination areas shall be managed as non-hazardous (solid) waste, and additional analysis for characteristics of hazardous waste derived from LBP is not a requirement for disposal. There were no high contamination areas in Building 440 Eastside.

#### 4.4 Polychlorinated Biphenyls (PCBs)

Rev. / Based on the HSAR for the Building 440 Eastside, interviews, facility walk-downs and a review of historical WSRIC processes, the facility did not have a history of PCB use or storage. The facility may have contained PCB fluorescent light ballast, however, all PCB ballast have been removed from the facility. Consequently, PCB sampling and analysis was not performed as part of this RLC/PDS and will not impact decontamination and decommissioning activities. Based on the age of the Building 440 Eastside (constructed after 1980), paints used do not contain PCBs.

### 5 PHYSICAL HAZARDS

Physical hazards associated with Building 440 consist of those common to standard industrial environments, and include hazards associated with energized systems, utilities, and trips and falls. There are no other unique hazards associated with the facility. The facility has been relatively well maintained and is in good physical condition, therefore, do not present hazards associated with building deterioration. However, care should be taken as Building 440 Eastside is located near the following IHSSs, PACs, or UBCs:

- 400-806, *Catalyst Spill, Building 440*, NFA approved 1992
- 400-157.2, *Radioactive Site South Area*, Active

Physical hazards are controlled per the Site Occupational Safety and Industrial Hygiene Program, which is based on OSHA regulations, DOE orders, and standard industry practices.

### 6 DATA QUALITY ASSESSMENT

Data used in making management decisions for decommissioning of Building 440 Eastside, and consequent waste management, are of adequate quality to support the decisions documented in this report. The data presented in this report (Attachments C and D) were verified and validated relative to DOE quality requirements, applicable EPA guidance, and original project DQOs.

In summary, the Verification and Validation (V&V) process corroborates that the following elements of the characterization process are adequate:

- ♦ the *number* of samples and surveys;
- ♦ the *types* of samples and surveys;
- ♦ the sampling/survey process as implemented “in the field”; and
- ♦ the laboratory analytical process, relative to accuracy and precision considerations.

Details of the DQA are provided in Attachment E.

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## 7 DECOMMISSIONING WASTE TYPES AND VOLUME ESTIMATES

The demolition and disposal of Building 440 Eastside will generate sanitary waste. Estimated waste volumes are presented below. PCB ballast and hazardous waste items have been removed and managed pursuant to Site PCB and waste management procedures.

WASTE TYPES AND VOLUME ESTIMATES							
Facility	Concrete (cu ft)	Wood (cu ft)	Metal (cu ft)	Corrugated Sheet Metal (cu ft)	Wall Board (cu ft)	ACM (cu ft)	Other Waste (cu ft)
Building 440 Eastside	16,000	0	6,000	2,000	0	0	None

## 8 FACILITY CLASSIFICATION AND CONCLUSIONS

Based on the analysis of radiological, chemical and physical hazards, Building 440 Eastside is classified as a RFCA Type 2 facility pursuant to the RFETS Decommissioning Program Plan (DPP; K-H, 1999) because of radiologically contaminated equipment (i.e., the C-Cell, Repack glovebox, and glovebox ventilation system) located in the Westside of the facility.

Building 440 Eastside does not possess radiological, asbestos or beryllium contamination in excess of the PDSP unrestricted release criteria. PCB ballast and hazardous waste items have been removed and disposed of in compliance with Environmental Protection Agency (EPA) and Colorado Department of Public Health and Environment (CDPHE) regulations.

The RLC/PDS for Building 440 Eastside was performed in accordance with the DDCP and PDSP, all PDSP DQOs were met, and all data satisfied the RLCP/PDSP DQA criteria. Building 440 Eastside can be demolished and the waste managed as sanitary waste. Environmental media beneath and surrounding the facility will be addressed at a future date in accordance with the Soil Disturbance Permit process and in compliance with RFCA. To ensure Building 440 Eastside remains free of contamination and that RLC/PDS data remain valid, isolation controls have been established and the facility posted accordingly.

## 9 REFERENCES

- DOE/RFEO, CDPHE, EPA, 1996. Rocky Flats Cleanup Agreement (RFCA), July 19, 1996.
- DOE Order 5400.5, "Radiation Protection of the Public and the Environment."
- DOE Order 414.1A, "Quality Assurance."
- EPA, 1994. "The Data Quality Objective Process," EPA QA/G-4.
- K-H, 1999. Decommissioning Program Plan, June 21, 1999.
- MAN-131-QAPM, *Kaiser-Hill Team Quality Assurance Program*, Rev. 1, November 1, 2001.
- MAN-076-FDPM, *Facility Disposition Program Manual*, Rev. 3, January 1, 2002.
- MAN-077-DDCP, *Decontamination and Decommissioning Characterization Protocol*, Rev. 4, July 15, 2002.
- MAN-127-PDSP, *Pre-Demolition Survey Plan for D&D Facilities*, Rev. 1, July 15, 2002.
- MARSSIM - Multi-Agency Radiation Survey and Site Investigation Manual (NUREG-1575, EPA 402-R-97-016).
- PRO-475-RSP-16.01, *Radiological Survey/Sampling Package Design, Preparation, Control, Implementation, and Closure*, Rev. 1, May 22, 2001.
- PRO-476-RSP-16.02, *Pre-Demolition (Final Status) Radiological Surveys of Surfaces and Facilities*, Rev. 1, May 22, 2001.
- PRO-477-RSP-16.03, *Radiological Samples of Building Media*, Rev. 1, May 22, 2001.
- PRO-478-RSP-16.04, *Radiological Survey/Sample Data Analysis for Final Status Survey*, Rev. 1, May 22, 2001.
- PRO-479-RSP-16.05, *Radiological Survey/Sample Quality Control for Final Status Survey*, Rev. 1, May 22, 2001.
- PRO-563-ACPR, Asbestos Characterization Procedure, Revision 0, August 24, 1999.
- PRO-536-BCPR, Beryllium Characterization Procedure, Revision 0, August 24, 1999.
- RFETS, Environmental Waste Compliance Guidance #25, Management of Polychlorinated Biphenyls (PCBs) in Paint and Other Bulk Product Waste During Facility Disposition.
- RFETS, Environmental Waste Compliance Guidance #27, Lead-Based Paint (LBP) and Lead-Based Paint Debris Disposal.
- RFETS, RFCA RSOP for Recycling Concrete, September 28, 1999
- RFETS, Historical Site Assessment Report for Area 5 - Group 9, Rev. 1, dated April 2003.

# ATTACHMENT A

## Facility Location Map

- Remaining Facility
- Demolished Facility
- Railroad removed
- Railroad remaining
- Demolished Road
- Paved Roads
- Dirt roads

- Fences removed
- Fences remaining

 Lakes  
 Streams


440 East

Feet = 1.401  
1 inch equals 33 feet

State Plane Coordinate Projection  
Colorado Central Zone (3476)  
Datum: NAD27

U.S. Department of Energy  
Rocky Flats Environmental Technology Site

GIS Dept. (303) 966-7701

Prepared By  
 **CH2MHILL**



Kaiser 100

# ATTACHMENT B

## Historical Site Assessment Report

**D&D RISS Facility Characterization  
Historical Site Assessment Report  
April, 2003 Rev. 1**

**Facility ID: (AREA 5 GROUP 9) Buildings 440 and 664**

Anticipated Facility Type (1, 2, or 3): Building 440 is an anticipated Type 2 facility, and 664 is an anticipated Type 1 Facility.

This facility-specific Historical Site Assessment (HSA) has been performed in accordance with:  
*D&D Characterization Protocol*, RFETS MAN-077-DDCP, latest version, and  
*Facility Disposition Program Manual*, RFETS MAN-076-FDPM, latest version

**Physical Description**

**Building 440**

Building 440 is an approximately 59,000 square foot structure built in 1971. The structure is a pre-fabricated building built on a concrete foundation. The exterior walls are constructed of insulated metal panels attached to a steel frame. The roof is constructed of metal decking with built-up roofing.

Building 440 has the following utilities: electrical, plant water, plant sanitary, plant steam, and fire protection is provided by an overhead sprinkler system and wall mounted fire extinguishers.

**Building 664**

Building 664 is an approximately 18,700 square foot building constructed in 1972. The structure is a pre-fabricated metal building built on a concrete foundation. The exterior walls are constructed of insulated metal panels attached to a steel frame. The roof is constructed of metal decking with built-up roofing.

Building 664 has the following utilities: electrical, plant water, plant sanitary, plant steam, and fire protection is provided by an overhead sprinkler system and wall mounted fire extinguishers.



**D&D RISS Facility Characterization  
Historical Site Assessment Report  
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**Historical Operations**

**Building 440**

Building 440 was originally constructed as a production control, shipping of products for final assembly and shipping wastes for disposal. Special nuclear materials and depleted uranium were staged and shipped out of this building by truck and railcar. In the early 1970s, Building 440 was also used to modify and repair railroad cars, semi-truck trailers, and escort vehicles to meet specific DOE requirements for transport of special nuclear materials and radioactive wastes. Vehicle modification work in Building 440 continued until 1994. Most of the original equipment associated with this activity has been shipped to other DOE plants. Production processes in Building 440 included various welding, painting, machining, pipe fitting, metal working, and electrical work used to modify transports. Modification efforts focused on developing entry deterrents. Paint booths were used to coat fabricated, non-nuclear components and the transports. The gantry and 5-ton cranes were used to move materials associated with the transport modification effort.

Building 440 was expanded three times to include a railcar bay, a high bay, paint booths, locker rooms in support of transport modification efforts and a 20,000 Square Foot Storage Area. Room 114 was a railcar bay. The railroad tracks, which were covered with poured concrete in the early 1990 is approximately 5 feet lower than the main building floor. Gantry cranes present in Rooms 105 and 114 were used to move equipment and materials used in the modification of safe secure transports. Industrial-sized paint booths were located in Rooms 113 and 123.

Currently Building 440 is used as a permitted, LLW, TRU, mixed waste storage, shipping, WIPP characterization, and waste repackaging facility. Building 440 installed 2 permacons and a glovebox with associated HEPA filtration systems, in the late 1999s and early 2000s, used to characterize and repackage non-conforming waste packages. There is no known building contamination (outside of the 2 permacons, glove box and associated ventilation systems). See the Building 440 WSRIC for a more detailed explanation of these activities.

**Building 664**

Building 664 is a waste storage, waste staging, and waste shipping facility and is a permitted LLW, mixed, and TRU wastes storage facility. All radioactive wastes received in Building 664 have already been packaged for final disposal in either 55-gallon metal drums or in metal or wooden crates. The contents of these packages are examined by an RTR unit to determine if the waste meets internal packaging requirements and off-site waste acceptance criteria. The packaged wastes is then labeled and marked before being shipped to their final destination. The building once housed fiberglass operations during the late 1980s and early 1990s, to seal LLW waste containers prior to shipping. The fiberglass operation was located on the west side of the facility and has been removed.

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**Current Operational Status**

Buildings 440 and 664 are operational waste storage and shipping facilities.

**Contaminants of Concern**

**Asbestos**

*Describe any potential, likely, or known sources of Asbestos:*

Building 664 and 440 are posted as potentially containing asbestos. The Industrial Hygiene Group (IH) has collected some asbestos data on the Building 440. Contact IH for a copy of this information.

**Beryllium (Be)**

*Describe any potential, likely, or known Be production or storage locations:*

None of the facilities addressed in this HSA are on the List of known Be Areas.

*Summarize any recent Be sampling results:*

There have been no recent Be samples collected on any of these facilities.

**Lead**

*Describe any potential, likely, or known sources of Lead (e.g., paint, shielding, etc.):*

Based on the age of some of the facilities addressed in this HSA, lead in paint may be a concern. No processes containing lead were conducted in these facilities.

**RCRA/CERCLA Constituents**

*Describe any potential, likely, or known sources of RCRA/CERCLA constituents (e.g., chemical storage, waste storage, and processes):*

Building 440 and 664 are permitted LLW, TRU, and mixed waste storage areas. See the Historical operations section above for a detailed listing of the operations which occurred in the facilities addressed in this HSA. Building 440 has RCRA Unit 440-1, which covers Container Storage, Repackaging, and Staging. This RCRA unit will be closed in accordance with the " The RCRA Part B Permit No. CO-97-05-30-01, Part X (6/30/97). Building 664 has RCRA Unit 20, which covers Container Storage in rooms 100, 110, and the High Bay Area. This RCRA unit will be closed in accordance with the " The RCRA Part B Permit No. CO-97-05-30-01, Part X (6/30/97).

*Describe any potential, likely, or known spill locations (and sources, if any):*

None of the facilities in this HSA have had any RCRA/CERCLA spills.

*Describe methods in which spills were mitigated, if any:*

None of the facilities in this HSA have had any RCRA/CERCLA spills.

**D&D RISS Facility Characterization  
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**PCBs**

*Describe any potential, likely, or known sources of PCBs (e.g., light ballasts, paints, equipment, etc.):*

No PCB containing process where housed in any of the facilities addressed in this HSA. Based on the age of construction of some of these facilities, PCBs in paint may be a concern.

*Describe any potential, likely, or known spill locations (and sources, if any):*

No PCB spills occurred in any of the Facilities addressed in this HSA.

*Describe methods in which spills were mitigated, if any:*

No PCB spills occurred in any of the Facilities addressed in this HSA.

**D&D RISS Facility Characterization  
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**Radiological Contaminants**

*Describe any potential, likely, or known radiological production or storage locations:*

Building 440 is a permitted LWW and TRU waste storage facility. Building 440 is also used for WIPP characterization and waste repackaging of non-conforming waste packages. Waste repackaging is performed in 2 permacons and a glove box. Any contamination associated from this activity is confined to the 2 permacons, glove box and associated HEPA ventilation system. The UBC section of the HRR states that uranium, on limited occasions, may have machined or modified in Building 440. No further evidence of this was found. Building 664 is a permitted waste staging, storage and shipping facility.

See the Historical Operations section above for a more detailed listing of the operations which occurred in the facilities addressed in this HSA.

*Describe any potential, likely, or known spill locations (e.g., known leaking sealed radioactive sources, leaking waste drums, potentially contaminated drains, etc.):*

An interviewee recalled that in the early day of operation of Building 440, the south dock area got contaminated with uranium during container movement operations. The contamination was cleaned up to the standards of the day using instrumentation of the day. Building 664 was a waste staging, storage and shipping facility, historically, the waste container sometime had residual contamination on there exterior. Because of this, occasional elevated reading were detected. These areas were cleaned to the standards of the day using instrumentation of the day.

*Describe methods in which spills were mitigated, if any:*

The contamination was cleaned up to the standards of the day using instrumentation of the day.

*Describe any potential, likely, or known isotopes of concern (e.g., weapons grade plutonium, uranium isotopes, pure beta emitters, mixed fission products, etc.):*

Isotopes of concern include uranium and plutonium.

*Describe any potential, likely, or known external facility contamination (e.g., stack release points, unfiltered ventilation, facility's physical location to known site releases, etc.):*

See section below for information on IHSSs PACs, and UBCs.

# D&D RISS Facility Characterization Historical Site Assessment Report April, 2003 Rev. 1

## Environmental Restoration Concerns

*Describe any ER concerns that could affect facility characterization (e.g., IHSSs, PACs, UBCs):*

Building 440 is associated with or located near the following IHSSs, PACs, or UBCs. See individual IHSS, PAC, or UBC report for additional information.

- 1) 400-806, "Catalyst Spill, Building 440", NFA approved 1992.
- 2) 400-157.2, "Radioactive site South Area", Active.

Building 440 is a UBC due to past machining and modification activities.

Building 664 is associated with or located near the following IHSSs, PACs, or UBCs. See individual IHSS, PAC, or UBC report for additional information.

- 1) 400 - 157.2, "Radioactive site South Area", Active.
- 2) 400 - 807, "Sandblasting Area", Active.
- 3) 600 - 121.2, "Fiberglassing area west of Building 664", Active.
- 4) 600 - 161, "Radioactive Site - Building 664", Active.

Trailers T664B and T664C are not associated with any IHSSs, PACs, or UBCs.

## Additional Information

*Describe any additional information that may be useful during facility characterization (e.g., contaminant migration routes, waste handling operations, physical hazards, Historical Release Reports, WSRIC data, etc.):*

None

## References

*Provide all sources of information utilized to gather data for facility history (e.g., documents, files, interviews):*

Sources reviewed to complete this HSA were the RFETS Facility List, the Historical Release Report, Site Master List of RCRA Units, and the Site IHSS, PAC, and UBC databases. The WSRIC for those buildings with a WSRIC. In addition, a facility walkdown and interviews were performed.

## Waste Volume Estimates and Material Types

Facility	Concrete (cu ft)	Wood (cu ft)	Metal (cu ft)	Corrugated Sheet Metal (cu ft)	Wall Board (cu ft)	ACM (cu ft)	Other Waste (cu ft)
<b>Building 440</b>	50,000	0	18000	6000	800	TBD	N/A
<b>Building 664</b>	19000	0	7500	3000	2500	TBD	N/A

## Further Actions

*Recommend any further actions, if any (e.g., characterization, decontamination, special handling, etc.):*

Begin the RLC/PDS process.

**D&D RISS Facility Characterization  
Historical Site Assessment Report  
April, 2003 Rev. 1**

**Note:**

This HSA was performed prior to SME walkdowns, and chemical and radiological characterization package preparations. SMEs should evaluate and/or verify all information during the RLC/PDS process. SMEs may need to review additional documentation and perform additional interviews. Information contained in this HSA only represents a "snapshot" in time. Subsequent data may be obtained during SME walkdowns and chemical and radiological characterization package preparations, which may conflict with this report. However, this report will not be amended, and the newer data will take precedence over the data in this report. Newer Data will appear in the RLCR/PDSR.

**Prepared By:**

Duane Parsons

Name



Signature

April 2003

Date

# ATTACHMENT C

## Radiological Data Summaries And Survey Maps

**Survey Area:** 5**Survey Unit:** 440501**Building:** 440**Description:** Building 440 Interior, Rooms 140A, 140B and 141, all surfaces

## Rocky Flats Environmental Technology Site Final Radiological Survey Summary Results

### Total Surface Activity Measurements

Nbr Random Measurements Required: 29

Nbr Biased Measurements Required: 19

Nbr QC Required: 2

Nbr Random Measurements Performed: 32

Nbr Biased Measurements Performed: 19

Nbr QC Performed: 2

#### Alpha

Maximum: 31.4 dpm/100cm<sup>2</sup>Minimum: -9.1 dpm/100cm<sup>2</sup>Mean: 10.9 dpm/100cm<sup>2</sup>

Standard Deviation: 9.2

QC Maximum: 11.8 dpm/100cm<sup>2</sup>QC Minimum: 7.3 dpm/100cm<sup>2</sup>QC Mean: 9.5 dpm/100cm<sup>2</sup>Transuranic DCGL<sub>w</sub>: 100.0 dpm/100cm<sup>2</sup>Transuranic DCGL<sub>EMC</sub>: 300.0 dpm/100cm<sup>2</sup>

### Removable Surface Activity Measurements

Nbr Random Measurements Required: 29

Nbr Biased Measurements Required: 19

Nbr Random Measurements Performed: 32

Nbr Biased Measurements Performed: 19

#### Alpha

Maximum: 3.9 dpm/100cm<sup>2</sup>Minimum: -1.5 dpm/100cm<sup>2</sup>Mean: -0.1 dpm/100cm<sup>2</sup>

Standard Deviation: 1.4

Transuranic DCGL<sub>w</sub>: 20.0 dpm/100cm<sup>2</sup>

### Media Sample Results

Nbr Random Required: 5

Nbr Biased Required: 0

Nbr Random Collected: 5

Nbr Biased Collected: 0

#### Uranium

Maximum: 0 dpm/100cm<sup>2</sup>Minimum: 0 dpm/100cm<sup>2</sup>Mean: 0 dpm/100cm<sup>2</sup>

Standard Deviation: 0

Uranium DCGL<sub>w</sub>: 5,000 dpm/100cm<sup>2</sup>Uranium DCGL<sub>EMC</sub>: 15,000 dpm/100cm<sup>2</sup>

#### Transuranic

Maximum: 0 dpm/100cm<sup>2</sup>Minimum: 0 dpm/100cm<sup>2</sup>Mean: 0 dpm/100cm<sup>2</sup>

Standard Deviation: 0

Transuranic DCGL<sub>w</sub>: 100 dpm/100cm<sup>2</sup>Transuranic DCGL<sub>EMC</sub>: 300 dpm/100cm<sup>2</sup>

*Conclusion - A comparison of the random, biased and QC measurement results against the PDSP Table 7-1 Surface Contamination Guideline limits was conducted; the comparison demonstrates that this survey unit passes the criterion specified in the PDSP.*



**Survey Area:** 5**Survey Unit:** 440501**Building:** 440**Description:** Building 440 Interior, Rooms 140A, 140B and 141, all surfaces

### Instrument Data Sheet

Inst/RCT Number	RCT ID	Analysis Date	Instr Model	Instru S/N	Probe Type	Calibration Due Dt	Instru Efficiency		A-Priori MDA (dpm/100cm <sup>2</sup> )		Survey Type
							Alpha	Beta	Alpha	Beta	
1	511390	04/26/05	Electra	2352	DP-6	06/09/05	0.221	NA	48.0	NA	T/S
2	515538	04/26/05	SAC-4	767	NA	08/03/05	0.330	NA	10.0	NA	R
3	515538	04/26/05	Electra	2352	DP-6	06/09/05	0.221	NA	48.0	NA	T/S
4	515538	05/04/05	Electra	657	AP-6	06/13/05	0.184	NA	300.0	NA	S
5	511466	05/04/05	Electra	673	AP-6	07/24/05	0.173	NA	300.0	NA	S
6	515538	05/04/05	Electra	659	DP-8	08/28/05	0.167	NA	300.0	NA	S
7	515538	05/05/05	Electra	3370	DP-6	07/27/05	0.213	NA	48.0	NA	T/S
8	511466	05/05/05	Electra	3370	DP-6	07/27/05	0.213	NA	48.0	NA	T/S
9	513922	05/09/05	Electra	2352	DP-6	06/09/05	0.221	NA	48.0	NA	T/S
10	513922	05/09/05	SAC-4	1130	NA	07/03/05	0.330	NA	10.0	NA	R
11	513922	05/09/05	SAC-4	767	NA	08/03/05	0.330	NA	10.0	NA	R

Survey Types: T = Total Surface Activity, Q = TSA QC, S = Scan, R = Removable Surface Activity, I = Investigation

25

**Survey Area:** 5

**Survey Unit:** 440501

**Building:** 440

**Description:** Building 440 Interior, Rooms 140A, 140B and 141, all surfaces

## Comments Sheet

**General** N/A

**Comments:**

**TSA** For instruments that were used for both TSAs and scans (T/S) on the Instrument Data Sheet, The TSA A-Priori MDA is 48.0 and the

**Comments:** scan A-Priori MDA is 300.0.

**RSA** N/A

**Comments:**

**Media** Media samples were collected from painted floor surfaces only. All other surfaces were either bare or the paint was factory original.

**Comments:**

Survey Area: 5

Survey Unit: 440501

Building: 440

Description: Building 440 Interior, Rooms 140A, 140B and 141, all surfaces

## Random Removable Surface Activity Data Sheet

Random Measurement Location	Pre Media Sample Data			Post Media Sample Data		
	Inst / RCT Nbr	Net Alpha (dpm/100cm <sup>2</sup> )	Net Beta (dpm/100cm <sup>2</sup> )	Inst / RCT Nbr	Net Alpha (dpm/100cm <sup>2</sup> )	Net Beta (dpm/100cm <sup>2</sup> )
440501PRP-N001	10	0.0	N/A	N/A	N/A	N/A
440501PRP-N002	11	2.4	N/A	N/A	N/A	N/A
440501PRP-N003	10	0.0	N/A	N/A	N/A	N/A
440501PRP-N004	11	0.9	N/A	N/A	N/A	N/A
440501PRP-N005	10	-1.5	N/A	N/A	N/A	N/A
440501PRP-N006	11	3.9	N/A	N/A	N/A	N/A
440501PRP-N007	2	-1.2	N/A	N/A	N/A	N/A
440501PRP-N008	2	-1.2	N/A	2	-1.2	N/A
440501PRP-N009	2	-1.2	N/A	N/A	N/A	N/A
440501PRP-N010	2	0.3	N/A	N/A	N/A	N/A
440501PRP-N011	10	-1.5	N/A	N/A	N/A	N/A
440501PRP-N012	11	0.9	N/A	N/A	N/A	N/A
440501PRP-N013	10	-1.5	N/A	N/A	N/A	N/A
440501PRP-N014	11	-0.6	N/A	N/A	N/A	N/A
440501PRP-N015	2	1.8	N/A	N/A	N/A	N/A
440501PRP-N016	2	-1.2	N/A	2	-1.2	N/A
440501PRP-N017	2	0.3	N/A	2	-1.2	N/A
440501PRP-N018	2	0.3	N/A	2	-1.2	N/A
440501PRP-N019	10	1.5	N/A	N/A	N/A	N/A
440501PRP-N020	11	0.9	N/A	N/A	N/A	N/A
440501PRP-N021	10	0.0	N/A	N/A	N/A	N/A
440501PRP-N022	11	-0.6	N/A	N/A	N/A	N/A
440501PRP-N023	2	1.8	N/A	N/A	N/A	N/A
440501PRP-N024	2	-1.2	N/A	2	-1.2	N/A
440501PRP-N025	2	1.8	N/A	N/A	N/A	N/A
440501PRP-N026	2	-1.2	N/A	N/A	N/A	N/A
440501PRP-N027	10	1.5	N/A	N/A	N/A	N/A
440501PRP-N028	11	-0.6	N/A	N/A	N/A	N/A
440501PRP-N029	10	-1.5	N/A	N/A	N/A	N/A

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**Survey Area:** 5**Survey Unit:** 440501**Building:** 440**Description:** Building 440 Interior, Rooms 140A, 140B and 141, all surfaces

### Random Removable Surface Activity Data Sheet

Random Measurement Location	Pre Media Sample Data			Post Media Sample Data		
	Inst / RCT Nbr	Net Alpha (dpm/100cm <sup>2</sup> )	Net Beta (dpm/100cm <sup>2</sup> )	Inst / RCT Nbr	Net Alpha (dpm/100cm <sup>2</sup> )	Net Beta (dpm/100cm <sup>2</sup> )
440501PRP-N030	11	-0.6	N/A	N/A	N/A	N/A
440501PRP-N031	10	1.5	N/A	N/A	N/A	N/A
440501PRP-N032	11	-0.6	N/A	N/A	N/A	N/A

**Survey Area:** 5**Survey Unit:** 440501**Building:** 440**Description:** Building 440 Interior, Rooms 140A, 140B and 141, all surfaces

### Biased Removable Surface Activity Data Sheet

Biased Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm <sup>2</sup> )	Net Beta (dpm/100cm <sup>2</sup> )	
440501PBP-N033	10	0.0	N/A	N/A
440501PBP-N034	11	-0.6	N/A	N/A
440501PBP-N035	10	-1.5	N/A	N/A
440501PBP-N036	11	0.9	N/A	N/A
440501PBP-N037	10	1.5	N/A	N/A
440501PBP-N038	11	-0.6	N/A	N/A
440501PBP-N039	10	-1.5	N/A	N/A
440501PBP-N040	11	-0.6	N/A	N/A
440501PBP-N041	10	-1.5	N/A	N/A
440501PBP-N042	11	2.4	N/A	N/A
440501PBP-N043	10	-1.5	N/A	N/A
440501PBP-N044	11	-0.6	N/A	N/A
440501PBP-N045	10	-1.5	N/A	N/A
440501PBP-N046	11	0.9	N/A	N/A
440501PBP-N047	10	1.5	N/A	N/A
440501PBP-N048	11	0.9	N/A	N/A
440501PBP-N049	10	-1.5	N/A	N/A
440501PBP-N050	11	-0.6	N/A	N/A
440501PBP-N051	10	3.0	N/A	N/A

Survey Area: 5

Survey Unit: 440501

Building: 440

Description: Building 440 Interior, Rooms 140A, 140B and 141, all surfaces

## Random/QC Total Surface Activity Data Sheet

Random Measurement Location	Pre Media Sample Data			Post Media Sample Data		
	Inst / RCT Nbr	Net Alpha (dpm/100cm <sup>2</sup> )	Net Beta (dpm/100cm <sup>2</sup> )	Inst / RCT Nbr	Net Alpha (dpm/100cm <sup>2</sup> )	Net Beta (dpm/100cm <sup>2</sup> )
440501PRP-N001	8	12.6	N/A	N/A	N/A	N/A
440501PRP-N002	8	19.2	N/A	N/A	N/A	N/A
440501PRP-N003	9	2.6	N/A	N/A	N/A	N/A
440501PRP-N004	9	2.6	N/A	N/A	N/A	N/A
440501PRP-N005	8	22.0	N/A	N/A	N/A	N/A
440501PRP-N006	8	26.7	N/A	N/A	N/A	N/A
440501PRP-N007	1	-9.1	N/A	3	12.7	N/A
440501PRP-N008	1	22.5	N/A	N/A	N/A	N/A
440501PRP-N009	1	9.0	N/A	N/A	N/A	N/A
440501PRP-N010	1	23.9	N/A	N/A	N/A	N/A
440501QRP-N010	9	7.3	N/A	N/A	N/A	N/A
440501PRP-N011	9	20.7	N/A	N/A	N/A	N/A
440501PRP-N012	9	-0.1	N/A	N/A	N/A	N/A
440501PRP-N013	8	-2.9	N/A	N/A	N/A	N/A
440501PRP-N014	8	9.8	N/A	N/A	N/A	N/A
440501PRP-N015	1	-0.1	N/A	N/A	N/A	N/A
440501PRP-N016	1	11.7	N/A	3	6.8	N/A
440501PRP-N017	1	-0.1	N/A	3	24.9	N/A
440501PRP-N018	1	5.8	N/A	3	18.6	N/A
440501PRP-N019	9	2.6	N/A	N/A	N/A	N/A
440501PRP-N020	9	4.4	N/A	N/A	N/A	N/A
440501PRP-N021	8	7.9	N/A	N/A	N/A	N/A
440501PRP-N022	8	6.5	N/A	N/A	N/A	N/A
440501PRP-N023	1	2.6	N/A	N/A	N/A	N/A
440501PRP-N024	1	9.0	N/A	3	-5.4	N/A
440501PRP-N025	1	18.0	N/A	N/A	N/A	N/A
440501PRP-N026	1	11.7	N/A	N/A	N/A	N/A

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**Survey Area:** 5**Survey Unit:** 440501**Building:** 440**Description:** Building 440 Interior, Rooms 140A, 140B and 141, all surfaces

### Random/QC Total Surface Activity Data Sheet

Random Measurement Location	Pre Media Sample Data			Post Media Sample Data		
	Inst / RCT Nbr	Net Alpha (dpm/100cm <sup>2</sup> )	Net Beta (dpm/100cm <sup>2</sup> )	Inst / RCT Nbr	Net Alpha (dpm/100cm <sup>2</sup> )	Net Beta (dpm/100cm <sup>2</sup> )
440501PRP-N027	9	7.2	N/A	N/A	N/A	N/A
440501PRP-N028	7	22.0	N/A	N/A	N/A	N/A
440501QRP-N028	9	11.8	N/A	N/A	N/A	N/A
440501PRP-N029	7	31.4	N/A	N/A	N/A	N/A
440501PRP-N030	8	12.6	N/A	N/A	N/A	N/A
440501PRP-N031	8	19.2	N/A	N/A	N/A	N/A
440501PRP-N032	9	9.0	N/A	N/A	N/A	N/A

**Survey Area:** 5**Survey Unit:** 440501**Building:** 440**Description:** Building 440 Interior, Rooms 140A, 140B and 141, all surfaces

### Biased Total Surface Activity Data Sheet

Biased Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm <sup>2</sup> )	Net Beta (dpm/100cm <sup>2</sup> )	
440501PBP-N033	7	16.4	N/A	N/A
440501PBP-N034	7	10.3	N/A	N/A
440501PBP-N035	7	19.7	N/A	N/A
440501PBP-N036	7	13.1	N/A	N/A
440501PBP-N037	7	29.0	N/A	N/A
440501PBP-N038	7	10.3	N/A	N/A
440501PBP-N039	7	19.7	N/A	N/A
440501PBP-N040	7	13.1	N/A	N/A
440501PBP-N041	7	-2.4	N/A	N/A
440501PBP-N042	7	-1.0	N/A	N/A
440501PBP-N043	7	7.0	N/A	N/A
440501PBP-N044	7	19.7	N/A	N/A
440501PBP-N045	7	19.7	N/A	N/A
440501PBP-N046	7	7.0	N/A	N/A
440501PBP-N047	8	7.0	N/A	N/A
440501PBP-N048	8	10.3	N/A	N/A
440501PBP-N049	7	3.7	N/A	N/A
440501PBP-N050	7	-2.4	N/A	N/A
440501PBP-N051	9	14.0	N/A	N/A



Survey Area: 5

Survey Unit: 440501

Building: 440

Description: Building 440 Interior, Rooms 140A, 140B and 141, all surfaces

## Media Samples Data Sheet

Site Sample ID / Nbr Description	Nuclide	Sample (pCi/g)	Sample MDA (pCi/g)	Weight (g)	Surface Area (in <sup>2</sup> )	Sample Nuclide (dpm/100cm <sup>2</sup> )	Sample Nuclide MDA (dpm/100cm <sup>2</sup> )	Sample Total (dpm/100cm <sup>2</sup> )
05Z1190-016.001 12 8	U234	0.0000	66.2000	20.70	26.3	0	1,793	Uranium 0 Transuranic 0
	U235	0.0000	0.3550			0	10	
	U238	0.0000	1.0900			0	30	
	Pu239/240	0.0000	1.3375			0	36	
	Am241	0.0000	0.1930			0	5	
05Z1190-017.001 17 16	U234	0.0000	74.8000	17.80	26.3	0	1,742	Uranium 0 Transuranic 0
	U235	0.0000	0.3120			0	7	
	U238	0.0000	1.1700			0	27	
	Pu239/240	0.0000	1.5454			0	36	
	Am241	0.0000	0.2230			0	5	
05Z1190-019.001 19 17, 18, 24	U234	0.0000	74.8000	17.80	26.3	0	1,742	Uranium 0 Transuranic 0
	U235	0.0000	0.3120			0	7	
	U238	0.0000	1.1700			0	27	
	Pu239/240	0.0000	1.5454			0	36	
	Am241	0.0000	0.2230			0	5	

# PRE-DEMOLITION SURVEY FOR B440

Survey Area: 5

Survey Units: 440501 thru 440506

Classification: 1 & 2

Building: 440

Survey Unit Description: 440 Key Plan

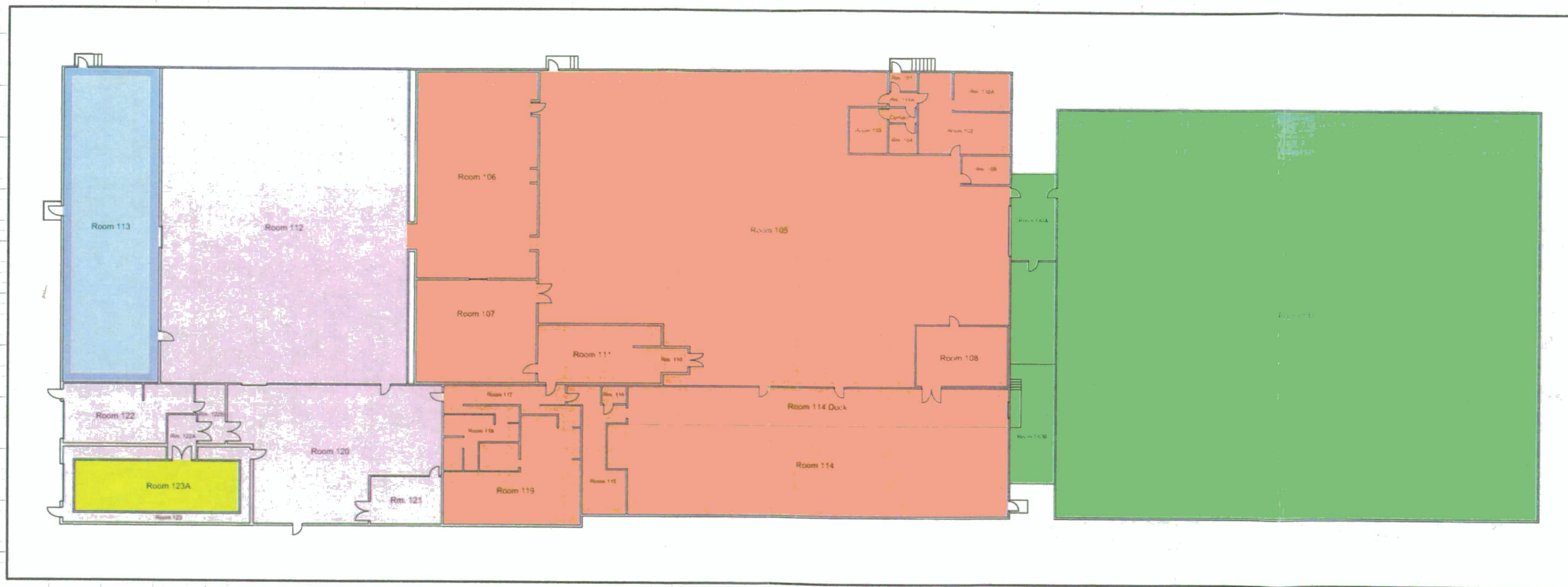
Total Area: 22,355 sq. m.

Floor Area: 6,404 sq. m.

PAGE 1 OF 1

## B440 Key Plan

For SME Reference ONLY  
Not For Sample Points



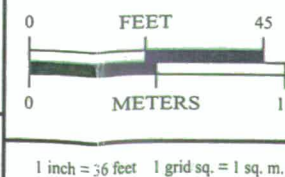
### SURVEY UNIT KEY

- |   |  |
|---|--|
| <span style="display:inline-block; width:15px; height:15px; background-color:blue; border:1px solid black;"></span> 440501      | <span style="display:inline-block; width:15px; height:15px; background-color:yellow; border:1px solid black;"></span> 440504 (Rm 123A Interior)              |
| <span style="display:inline-block; width:15px; height:15px; background-color:orange; border:1px solid black;"></span> 440502    | <span style="display:inline-block; width:15px; height:15px; background-color:lightblue; border:1px solid black;"></span> 440505 (Rm 113 Lower Walls & Floor) |
| <span style="display:inline-block; width:15px; height:15px; background-color:lightblue; border:1px solid black;"></span> 440503 | <span style="display:inline-block; width:15px; height:15px; background-color:blue; border:1px solid black;"></span> 440506 (Rm 113 Upper Walls & Ceiling)    |

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For SME Reference ONLY  
Not For Sample Points

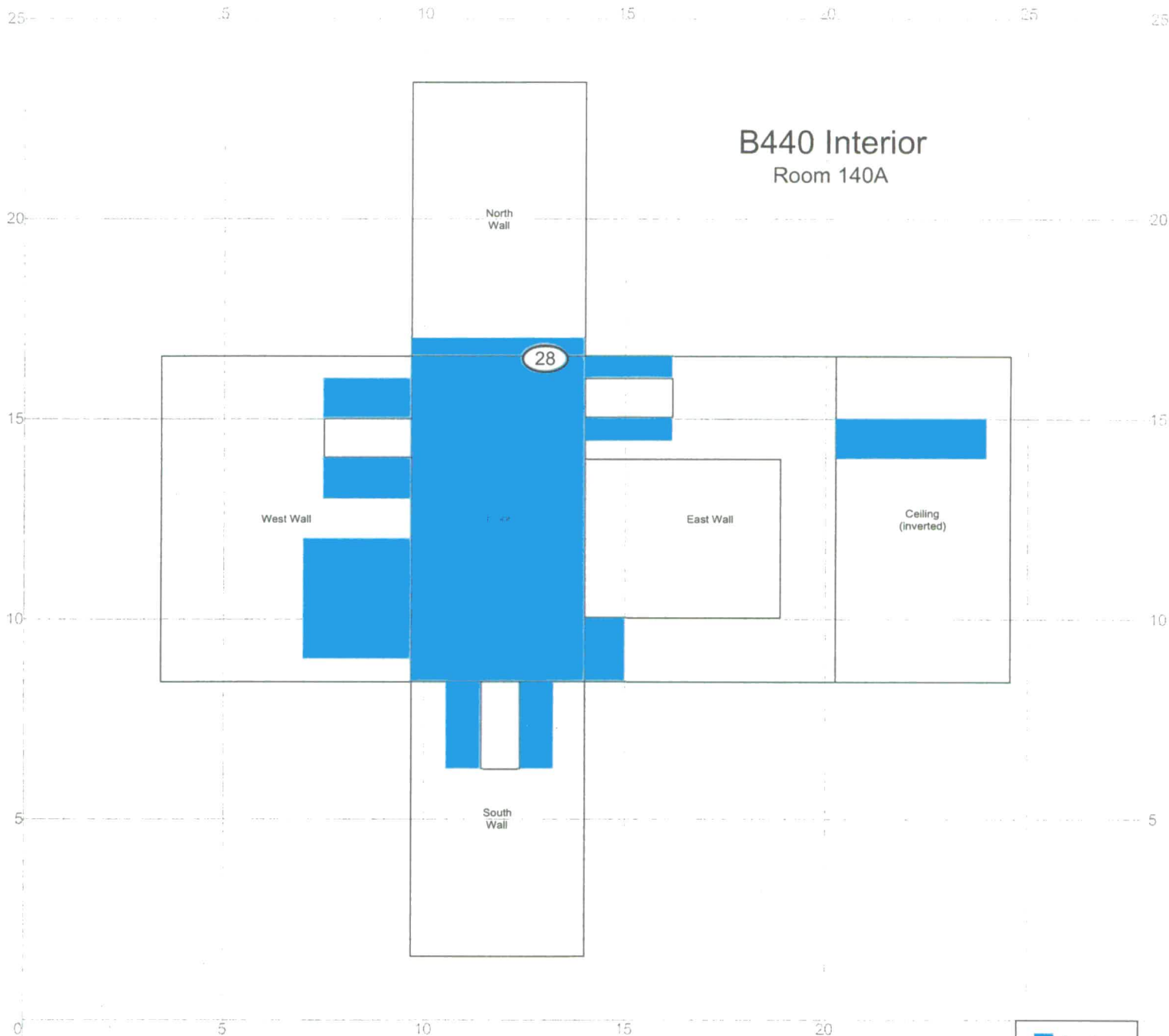


U.S. Department of Energy Rocky Flats Environmental Technology Site	
Prepared by: GIS Dept. 303-966-7707	Prepared for:
 <b>CH2MHILL</b> Communications Group	 <b>KAISER HILL</b> COMPANY
MAP ID: 03-0305/B440-KP	March 18, 2003

# RLC/PDS SURVEY FOR B440

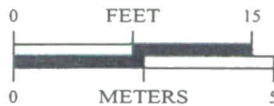
Survey Area: 5      Survey Unit: 440501      Classification: 2  
 Building: 440  
 Survey Unit Description: East Side B440 Interior, Rooms 140A, 140B & 141, all surfaces  
 Total Area: 6,276 sq. m.      Floor Area: 1,904 sq. m.  
 Grid Spacing for Survey Points: 15m X 15m

PAGE 1 OF 3



**SURVEY MAP LEGEND**  
 # Smear & TSA Location  
 # Smear, TSA & Sample Location  
 ■ Open/Inaccessible Area  
 ■ Area Shown in Another View

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**Scan Survey Information**  
 Survey Instrument ID #(s) & RCT ID #(s):  
 1, 3-9

1 inch = 12 feet    1 grid sq. = 1 sq. m.

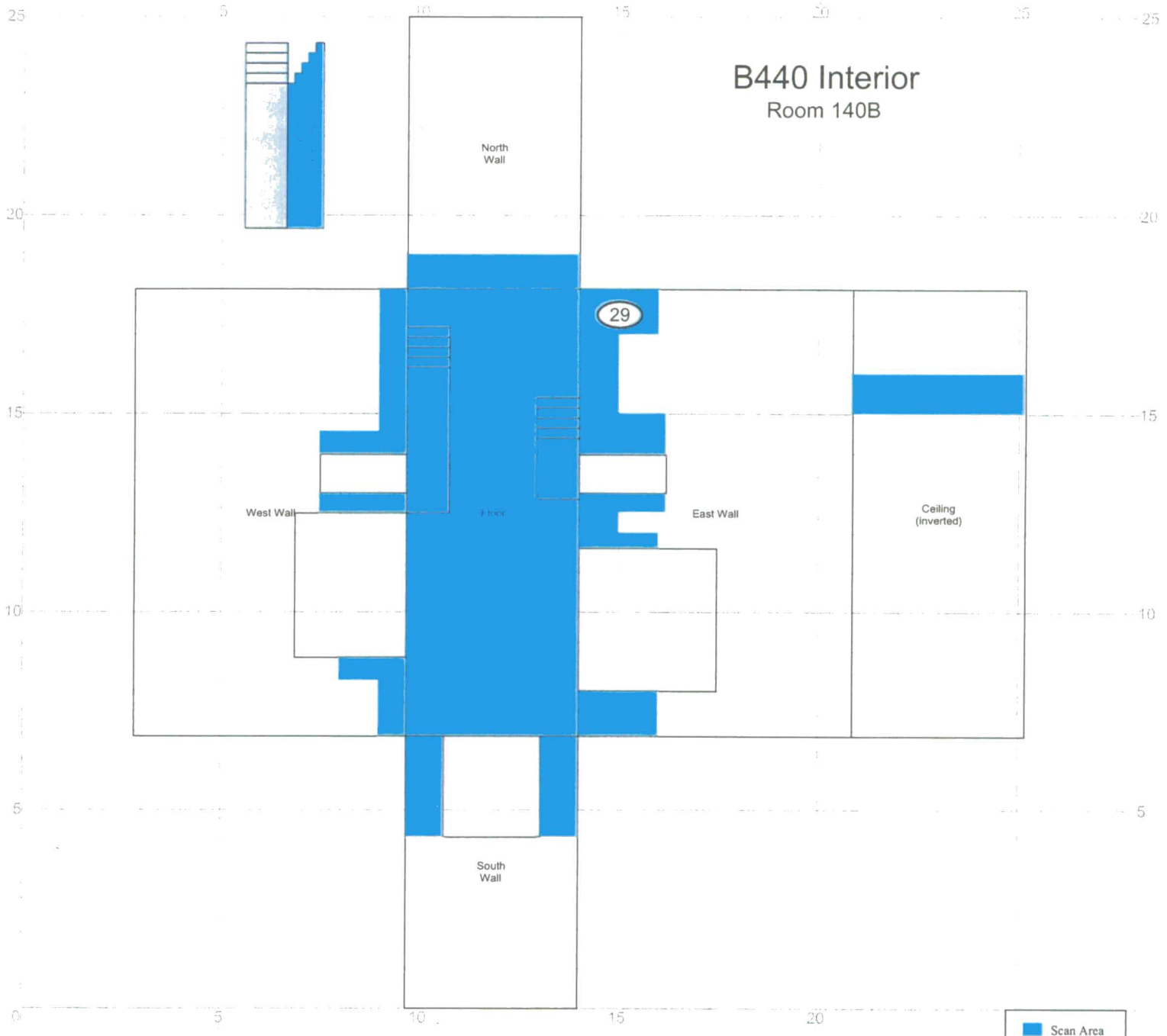
U.S. Department of Energy  
 Rocky Flats Environmental Technology Site  
 Prepared by: GIS Dept. 303-966-7707      Prepared for:  
 **CH2MHILL**  
 Communications Group  
 **KAISER HILL**  
 CONSULTANTS  
 MAP ID: 03-0305/440001-1\_SC      May. 11, 2005

■ Scan Area

# RLC/PDS SURVEY FOR B440

Survey Area: 5      Survey Unit: 440501      Classification: 2  
 Building: 440  
 Survey Unit Description: East Side B440 Interior, Rooms 140A, 140B & 141, all surfaces  
 Total Area: 6,276 sq. m.      Floor Area: 1,904 sq. m.  
 Grid Spacing for Survey Points: 15m X 15m

PAGE 2 OF 3



<p><b>SURVEY MAP LEGEND</b></p> <ul style="list-style-type: none"> <li>Smear &amp; TSA Location</li> <li>Smear, TSA &amp; Sample Location</li> <li>Open/Inaccessible Area</li> <li>Area Shown in Another View</li> </ul>	<p>Neither the United States Government, nor Kaiser Hill Co., nor CH2M Hill, nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights.</p> <p><b>Scan Survey Information</b>                  Survey Instrument ID #(s) &amp; RCT ID #(s):                  1, 3-9</p>	<p><b>N</b></p> <p>0 15 0 5</p> <p>FEET METERS</p> <p>1 inch = 12 feet 1 grid sq. = 1 sq. m.</p>	<p>U.S. Department of Energy                  Rocky Flats Environmental Technology Site</p> <p>Prepared by: GIS Dept. 303-966-7707      Prepared for:</p> <p><b>CH2MHILL</b>      <b>KAISER HILL</b>                  Communications Group      COMPANY</p> <p>MAP ID: 03-0305/440001-2_SC      May. 11, 2005</p>
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# RLC/PDS SURVEY FOR B440

Survey Area: 5      Survey Unit: 440501      Classification: 2  
 Building: 440  
 Survey Unit Description: East Side B440 Interior, Rooms 140A, 140B & 141, all surfaces  
 Total Area: 6,276 sq. m.      Floor Area: 1,904 sq. m.  
 Grid Spacing for Survey Points: 15m X 15m

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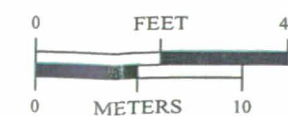
B440 Interior  
Room 141

## SURVEY MAP LEGEND

- Smear & TSA Location
- ◇ Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area Shown in Another View

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Scan Survey Information  
 Survey Instrument ID #(s) & RCT ID #(s):  
 1, 3-9



1 inch = 30 feet    1 grid sq. = 1 sq. m.

U.S. Department of Energy  
 Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707



MAP ID: 03-0305/440001-3\_SC

Prepared for:



May. 11, 2005

## ATTACHMENT D

### Chemical Data Summaries And Sample Maps

### Beryllium Data Summary

Sample Number	Map Survey Point Location	Room	Sample Location	Result ( $\mu\text{g}/100 \text{ cm}^2$ )
<b>Building 440 Eastside - RIN 05C0243</b>				
440-05022005-00-007	7	141	Top Of Electrical Box	< 0.1
440-05022005-00-008	8	141	Floor	< 0.1
440-05022005-00-010	10	141	Floor	< 0.1
440-05022005-00-019	19	141	Floor	< 0.1
440-05022005-00-021	21	141	Floor	< 0.1
440-05022005-00-029	29	141	Floor	< 0.1
440-05022005-00-035	35	141	Floor	< 0.1
440-05022005-00-038	38	141	Floor	< 0.1
440-05022005-00-049	49	141	Floor	< 0.1
440-05022005-00-051	51	141	Floor	< 0.1
440-05022005-00-055	55	141	Floor	< 0.1
440-05022005-00-065	65	141	Floor	< 0.1
440-05022005-00-067	67	141	Floor	< 0.1
440-05022005-00-073	73	141	Top Of Cabinet	< 0.1
440-05022005-00-074	74	141	Top Of Cabinet	< 0.1
440-05022005-00-086	86	141	Electrical Box	< 0.1
440-05022005-00-087	87	141	Electrical Box	< 0.1

Note: Eight-seven (87) beryllium samples were collected throughout Building 440. The above sample numbers are for the Eastside only. The Westside RLCR/PDSR will report the missing numbers in the numbering sequence.



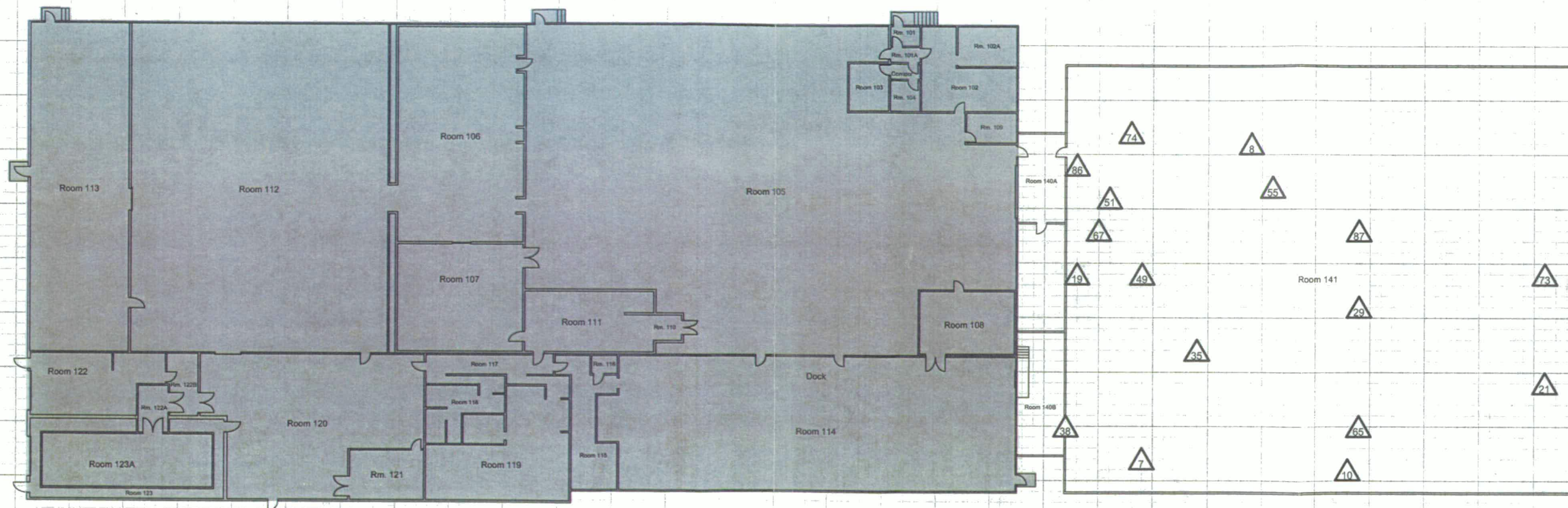
# CHEMICAL SAMPLE MAP

Building 440 East Side  
Beryllium

PAGE 1 OF 1

West Side

East Side

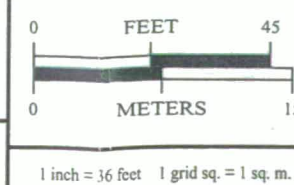


## SURVEY MAP LEGEND

- Asbestos Sample Location
- Beryllium Sample Location
- Lead Sample Location
- RCRA/CERCLA Sample Location
- PCB Sample Location

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- Open/Inaccessible Area
- Area in 440 West Side RLC/PDS



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Prepared by: GIS Dept. 303-966-7707  
Prepared for:  
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Communications Group  
Kaiser Hill  
Company  
MAP ID: 03-0305/B440-KP  
May 11, 2005



# ATTACHMENT E

## Data Quality Assessment (DQA) Detail

## DATA QUALITY ASSESSMENT (DQA)

### VERIFICATION & VALIDATION (V&V) OF RESULTS

V&V of the data confirm that appropriate quality controls are implemented throughout the sampling and analysis process, and that any substandard controls result in qualification or rejection of the data in question. The required quality controls and their implementation are summarized in a tabular, checklist format for each category of data – radiological surveys and chemical analyses (specifically beryllium).

DQA criteria and results are provided in a tabular format for each suite of surveys or chemical analyses performed. The radiological survey assessment is provided in Table E-1 and Beryllium in Table E-2. A data completeness summary for all results is given in Table E-3.

All relevant Quality records supporting this report are maintained in the RISS Characterization Project File. The report will be submitted to the CERCLA Administrative Record for permanent storage within 30 days of approval by the Regulators. All radiological data are organized into Survey Packages, which correlate to unique (MARSSIM) Survey Units. Chemical data are organized by RIN (Report Identification Number) and are traceable to the sample number and corresponding sample location.

Beta/gamma survey designs were not implemented for the Building 440 Eastside based on the conservatism of the transuranic limits used as DCGLs in the unrestricted release decision process. Survey designs were implemented based on the transuranic limits used as DCGLs in the unrestricted release decision process. Transuranic isotope activity and Uranium and/or other naturally occurring isotope activity were evaluated against, and were less than the Transuranic DCGL<sub>w</sub> (100 dpm/100cm<sup>2</sup>) and the Uranium DCGL<sub>w</sub> (5,000 dpm/100cm<sup>2</sup>) unrestricted release limits. Media samples were taken and analyzed by ISOCS Canberra gamma spectroscopy. Uranium and/or other naturally occurring isotope activity were evaluated against, and were less than the Transuranic DCGL<sub>w</sub> (100 dpm/100cm<sup>2</sup>) and the Uranium DCGL<sub>w</sub> (5,000 dpm/100cm<sup>2</sup>) unrestricted release limits. Media results were converted to dpm/100cm<sup>2</sup> using the Media Conversion Table, evaluated against the uranium DCGL limits, and are the values reported in the Radiological TSA Data Summary in support of the unrestricted release decision process. All results were less than the PDSP unrestricted release limits.

Consistent with EPA's G-4 DQO process, the radiological survey design for each survey unit performed per PDS requirements was optimized by checking actual measurement results acquired during pre-demolition surveys against the model output with original estimates. Use of actual sample/survey (result) variances in the MARSSIM DQO model confirms that an adequate number of surveys were acquired.

## DQA SUMMARY

In summary, the data presented in this report have been verified and validated relative to the quality requirements and project decisions as stated in the original DQOs. All data are useable based on qualifications stated herein and are considered satisfactory without qualification. All media surveyed and sampled yielded results less than their associated action levels and with acceptable certainties.

Based upon an independent review of the radiological data, it is determined that the original project DQOs satisfied MARSSIM guidance. All facility contamination levels were below applicable DCGL unrestricted release levels. Minimum survey requirements were met, sampling/survey protocol was performed in accordance with applicable RSPs, survey units were properly designed and bounded, and instrument performance and calibration was verified as acceptable. All results meet the PDS unrestricted release criteria.

Chain of Custody was intact; documentation was complete, hold times were acceptable (where applicable,) and packaging integrity/custody seals were maintained throughout the sampling/analysis process. Level 2 Isolation Controls have been posted to prevent the inadvertent introduction of contamination into the facilities. On this basis, Building 440 Eastside meets the unrestricted release criteria with the confidences stated herein.

**Table E-1 V&V of Radiological Results – Building 440 Eastside**

V&V CRITERIA, RADIOLGICAL SURVEYS		K-H RSP 16.00 Series MARSSIM (NUREG-1575)		
QUALITY REQUIREMENTS				
	Parameters	Measure	Frequency	COMMENTS
ACCURACY	Initial calibrations	90%<x<110%	≥1	Multi-point calibration through the measurement range encountered in the field; programmatic records.
	Daily source checks	80%<x<120%	≥1/day	Performed daily/within range.
	Local area background: Field	typically < 10 dpm	≥1/day	All local area backgrounds were within expected ranges (i.e., no elevated anomalies.)
PRECISION	Field duplicate measurements for TSA	≥5% of real survey points	≥10% of reals	N/A
REPRESENTATIVENESS	MARSSIM methodology: Survey Unit 440501 (interior) and EXT-B-001 (exterior).	statistical and biased	NA	Random w/ statistical confidence.
	Survey Maps	NA	NA	Random and biased measurement locations controlled/mapped to ±1m.
	Controlling Documents (Characterization Pkg; RSPs)	qualitative	NA	Refer to the Characterization Package (planning document) for field/sampling procedures (located in Project files); thorough documentation of the planning, sampling/analysis process, and data reduction into formats.
COMPARABILITY	Units of measure	dpm/100cm <sup>2</sup>	NA	Use of standardized engineering units in the reporting of measurement results.
COMPLETENESS	Plan vs. Actual surveys Usable results vs. unusable	>95% >95%	NA	See Table D-3 for details.
SENSITIVITY	Detection limits	TSA: ≤50 dpm/100cm <sup>2</sup> RA: ≤10 dpm/100cm <sup>2</sup>	all measures	MDAs ≤ 50% DCGL <sub>w</sub>

**Table E-2 V&V of Beryllium Results – Building 440 Eastside**

V&V CRITERIA, CHEMICAL ANALYSES		DATA PACKAGE		COMMENTS
BERYLLIUM	Prep: NMAM 7300 METHOD: OSHA ID-125G	LAB ---->	Johns Manville, Littleton, Co.	
		RIN ---->	RIN05C0243	
QUALITY REQUIREMENTS		Measure	Frequency	All results were below associated action levels.
ACCURACY	Calibrations		≥1	
	Initial	linear calibration	≥1	
	Continuing	80%<%R<120%	≥1	
	LCS/MS	80%<%R<120%	≥1	
	Blanks – lab & field	<MDL	≥1	
	Interference check std (ICP)	NA	NA	
PRECISION	LCSD	80%<%R<120% (RPD<20%)	≥1	
	Field duplicate	all results < RL	≥1	
REPRESENTATIVENESS	COC	Qualitative	NA	
	Hold times/preservation	Qualitative	NA	
	Controlling Documents (Plans, Procedures, maps, etc.)	Qualitative	NA	
COMPARABILITY	Measurement units	ug/100cm <sup>2</sup>	NA	
COMPLETENESS	Plan vs. Actual samples	>95%	NA	
	Usable results vs. unusable	>95%	NA	
SENSITIVITY	Detection limits	MDL of 0.00084 ug/100cm <sup>2</sup>	all measures	

**Table E-3 Data Completeness Summary – Building 440 Eastside**

ANALYTE	Building/Area/ Unit	Sample Number Planned (Real & QC)	Sample Number Taken (Real & QC)	Project Decisions (Conclusions) & Uncertainty	Comments (RIN, Analytical Method, Qualifications, etc.)
Beryllium	Building 440 Eastside (interior)	17 samples (15 random/2 biased)	<sup>A</sup> 17 samples (15 random/2 biased)	No contamination found at any location, all results were below associated action levels	10CFR850; OSHA ID-125G  RIN05C0243 - Bldg. 440 Eastside Be Map Locations: 7, 8, 10, 19, 21, 29, 35, 38, 49, 51, 55, 65, 67, 73, 74, 86 and 87. The remaining samples can be found in the Bldg. 440 Westside RLC/PDS Report.  <sup>A</sup> The Chemical Characterization Plan required 75 random and 12 biased samples based on Building 440 square footage. As this RLC/PDS applies only to the Eastside, only 15 random and 2 biased samples were taken and are reported in this Eastside RLC/PDS. The remaining samples required per the CCP were taken in Building 440 Westside and will be reported in the Westside RLCR/PDSR.  No results above the action level (0.2 ug/100cm <sup>2</sup> ) or investigative level (0.1 ug/100cm <sup>2</sup> .)
Radiological	Survey Area 5 Survey Unit: 440501 Building 440 – Rooms 140A, 140B and 141 Floor, Walls and Ceiling (Interior)	51 $\alpha$ TSA (32 systematic/19 biased)  51 $\alpha$ Smears (32 systematic/19 biased)  5 Media Samples and 5 PRE and 5 POST TSA and RSA samples  2 QC TSA  50% scan of the floor; 5% scan of the remaining interior surfaces	51 $\alpha$ TSA (32 systematic/19 biased)  51 $\alpha$ Smears (32 systematic/19 biased)  5 Media Samples and 5 PRE and 5 POST TSA and RSA samples  2 QC TSA  50% scan of the floor; 5% scan of the remaining interior surfaces	No contamination at any location; all values below unrestricted release levels	Transuranic DCGLs used.